

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

---

In re Patent Application of:  
Akira Watanabe

Application No.: 10/716,622

Confirmation No.: 6336

Filed: November 20, 2003

Art Unit: 2164

For: PACKET SEARCH DEVICE, PACKET  
PROCESSING SEARCH METHOD USED FOR  
THE SAME, AND PROGRAM FOR THE  
SAME

---

Examiner: H. A. Hotelling

**APPEAL BRIEF**

MS Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

As required under § 41.37(a), this brief is filed more than two months after the Notice of Appeal filed in this case on December 21, 2009, but less than one month from the February 26, 2010 mailing of the Notice of Panel Decision from Pre-Appeal Brief Review, and is in furtherance of said Notice of Appeal.

The fees required under § 41.20(b)(2) are dealt with in the accompanying  
TRANSMITTAL OF APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1205.2:

- I. Real Party In Interest
- II Related Appeals and Interferences

III.	Status of Claims
IV.	Status of Amendments
V.	Summary of Claimed Subject Matter
VI.	Grounds of Rejection to be Reviewed on Appeal
VII.	Argument
VIII.	Claims
Appendix A	Claims
Appendix B	Evidence
Appendix C	Related Proceedings

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

NEC CORPORATION

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 13 claims pending in application.

B. Current Status of Claims

1. Claims canceled: 2, 3, 10 and 11
2. Claims withdrawn from consideration but not canceled: None
3. Claims pending: 1, 4-9 and 12-17
4. Claims allowed: None
5. Claims rejected: 1, 4-9 and 12-17

C. Claims On Appeal

The claims on appeal are claims 1, 4-9 and 12-17

#### IV. STATUS OF AMENDMENTS

Applicant filed an Amendment After Final Rejection on October 30, 2009. The Examiner responded to the Amendment After Final Rejection in an Advisory Action mailed November 17, 2009. In the Advisory Action, the Examiner indicated that Applicants' proposed amendments to the claims will be entered.

Accordingly, the claims enclosed herein as Appendix A do incorporate the amendments to the claims, as indicated in the paper filed October 30, 2009.

#### V. SUMMARY OF CLAIMED SUBJECT MATTER

The following descriptions of independent claims 1, 9 and 17 refer to the embodiments described in the specification and figures.

Specification citations are provided in accordance with 37 C.F.R. § 41.37, such reference numerals and citations are merely examples of where support may be found in the specification. There is no intention to suggest in any way that the terms of the claims are limited to the examples in the specification or the specific citations used. As demonstrated by the reference numerals and citations below, the claims are fully supported by the specification as required by law. However, it is improper under the law to read limitations from the specification into the claims. The reference numerals and specification citations are not to be construed as claims limitations or in any way used to limit the scope of the claims.

##### A. Independent Claim 1:

A packet search device that performs packet filter search for an inputted packet, comprising:

a first search processor (e.g., 32b) that searches predetermined conditional statements corresponding to a plurality of information areas included in header information of said packet

using a first search method to generate first search results (See, e.g., Fig. 3; page 10, line 26 to page 11, line 12; Fig. 7 at step S4); and

a second search processor (e.g., 32d) that searches the first search results of said first search processor using a second search method that is different from said first search method (See, e.g., Fig. 3; page 11, lines 13-19; Fig. 7 at step S7),

wherein said first search processor (e.g., 32b) divides said packet header information into a plurality of information areas and searches across each search conditional statements structured as binary search trees for each of said information areas separately (See, e.g., page 5, lines 15-20; Fig. 3; page 10, line 26 to page 11, line 12; Fig. 7 at step S4), and

wherein said second search processor (e.g., 32d) searches aggregated search results of said first search processor using a Hash method (See, e.g., page 5, lines 15-20; Fig. 3; page 11, lines 13-19; Fig. 7 at step S7).

#### B. Independent Claim 9:

A packet processing search method, on a packet search device that includes a first search processor and a second search processor, that searches for a packet filter for an inputted packet before performing packet processing, comprising:

a first step of the first search processor (e.g., 32b) searching predetermined conditional statements corresponding to a plurality of information areas included in header information of said packet using a first search method to generate first search results (See, e.g., Fig. 3; page 10, line 26 to page 11, line 12; Fig. 7 at step S4); and

a second step of the second search processor (e.g., 32d) searching the first search results at said first step using a second search method that is different from said first search method (See, e.g., Fig. 3; page 11, lines 13-19; Fig. 7 at step S7),

wherein in said first step the first search processor (e.g., 32b) divides said packet header information into a plurality of information areas and searches across each search conditional statements structured as binary search trees for each of said information areas separately (See, e.g., page 5, lines 15-20; Fig. 3; page 10, line 26 to page 11, line 12; Fig. 7 at step S4), and

wherein in said second step the second search processor (e.g., 32d) searches aggregated search results of said first step using a Hash method (See, e.g., page 5, lines 15-20; Fig. 3; page 11, lines 13-19; Fig. 7 at step S7).

#### C. Independent Claim 17:

A computer-readable medium (e.g., 73) storing a program for causing a program-controlled packet search device that includes a first search processor and a second search processor to perform a packet processing search method that searches for a packet filter for an inputted packet before performing packet processing, causing the program-controlled packet search device to execute,

first processing by the first search processor (e.g., 32b) that searches predetermined conditional statements corresponding to a plurality of information areas included in header information of said packet using a first search method to generate first search results (See, e.g., Fig. 3; page 10, line 26 to page 11, line 12; Fig. 7 at step S4); and

second processing by the second search processor (e.g., 32d) that searches the first search results of said first processing using a second search method that is different from said first search method (See, e.g., Fig. 3; page 11, lines 13-19; Fig. 7 at step S7),

wherein in said first processing the first search processor (e.g., 32b) divides said packet header information into a plurality of information areas and searches across each search conditional

statements structured as binary search trees for each of said information areas separately (See, e.g., page 5, lines 15-20; Fig. 3; page 10, line 26 to page 11, line 12; Fig. 7 at step S4), and

wherein in said second processing the second search processor (e.g., 32d) searches aggregated search results of said first step using a Hash method (See, e.g., page 5, lines 15-20; Fig. 3; page 11, lines 13-19; Fig. 7 at step S7).

#### VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. The rejection of claims 1, 4-9 and 12-17 under 35 U.S.C. § 103 over U.S. Patent No. 6,754,662 (Li) in view of U.S. Publication No. 2004/49494 (Kottisa).<sup>1</sup>

#### VII. ARGUMENT

A. Claims 1, 4-9 and 12-17 are not rendered obvious by Li in view of Kottisa.

##### Independent claims 1, 9 and 17

Independent claim 1 is directed to a packet search device that includes, inter alia, a first search processor that searches predetermined conditional statements corresponding to a plurality of information areas included in header information of an inputted packet, to generate first search results using a first search method. The packet search device also includes a second search processor that searches the first search results of the first search processor using a second search method that is different from the first search method.

The first search processor divides the packet header information into a plurality of information areas and searches across each search conditional statement structured as binary search

---

<sup>1</sup> In the Final Office Action mailed October 8, 2009, claim 1-17 were rejected on this basis. However, claims 2, 3, 10 and 11 were cancelled without prejudice in the Amendment in Response to Final Office Action filed October 30, 2009, which was indicated as being entered (upon appeal) in the Advisory Action mailed November 17, 2009.

trees for each of the information areas separately, and the second search processor searches aggregated search results of the first search processor using a Hash method.

By virtue of the claimed structure, search trees are divided since searches are performed for each information area separately. As a result, search trees are smaller and therefore more easily managed than trees that are not so divided, and editing processing is curtailed. Also, because the search processing of the information areas involve no interdependency therebetween, the search processing can be carried out in parallel, speeding up search processing.

Further, the second search utilizes a Hash method to perform search *on the aggregated search result*. As a result, less Hash values are required and high speed searching can be achieved. Thus, claim 1 recites, inter alia, performing a first search using binary search trees separately for each of information areas, and performing a second search, on the aggregated search results from the first search, the second search being done using a Hash method on the aggregated result.

Li contains no teaching that header information of a packet is divided into a plurality of information areas, and each information area is searched across each conditional statement structured as a binary search tree separately. Moreover, Li does not teach that search results of all information areas are aggregated and the aggregated search result is searched using a Hash method.

In the Advisory Action dated November 17, 2009, the Examiner dismissed the above argument by stating, on the Continuation Sheet, that “the applicant does not support his arguments with factually supported objective evidence.” In the first place, in the October 8, 2009 Final Office Action, with respect to the feature of dividing the header information into a plurality of information areas and using search trees, the Examiner stated that this feature (at the time recited in dependent claim 2) was found in Li at col. 5, lines 54-57. This is not correct. The cited portion of Li reads as follows:

It should be noted that the choice of data structures (i.e. a link list or a binary tree or other structure) may depend on the particular design objective of the packet classifier. For example, if simplicity is desired, a link list may be used, while if high speed is desired, a binary search tree may-be utilized.

While this portion of Li may be said to show that the choice of whether to use a link list, or binary tree, or other structure, depends on the design objective, it says nothing whatsoever relating to what is explicitly recited in claim 1, i.e., that the first search processor divides the packet header information into a plurality of information areas and searches across each search conditional statements structured as binary search trees for each of the information areas separately. As discussed previously, searching the divided packet header areas separately in the claimed manner has the advantages discussed above. The above-quoted portion of Li, alleged to meet this recited feature, shows no teaching or recognition of the feature itself, still less any recognition of any advantage such feature would have.

Thus, as was pointed out previously, and contrary to the statement in the Advisory Action, the Office Action has failed to identify any portion of Li that teaches the feature in question, and has therefore failed to set forth a prima facie case of obviousness. As the quoted portion of Li was relied upon as allegedly meeting the abovementioned feature of claim 1, claim 1 is believed clearly patentable over the cited references, taken individually or in combination. This feature is also present in amended independent claims 9 and 17, which are believed patentable for at least the same reasons.

The Office Action has also failed to identify any portion of Li that reads on the feature of amended claim 1 (previously recited in dependent claim 3) by which a second search processor searches *the aggregated search results of the first search processor*, using a Hash method. In the October 8, 2009 Final Office Action, the Examiner took the position that this feature was taught in Li at col. 3, lines 38-39 and col. 4, lines 7-9.

In the first place, as Li does not teach the feature of dividing the packet header information into a plurality of information areas and searching across each search conditional statements structured as binary search trees for each of the information areas separately, it cannot be said to teach doing anything to the aggregated search results of such a first processor, since Li has no conception of the recited aggregated search results. Thus, Li cannot teach searching the aggregated search results the first search processor at all, still less using a Hash method as claimed.



Second, the portions of Li cited as allegedly teaching this feature do no such thing. Col. 3, lines 38-39 discusses the use of a hash table generally, but contains no teaching of using a Hash method to search aggregated search results from a previous search. Col. 4, lines 7-9 simply discusses that computer cache may contain a hash table. Thus, contrary to the position taken at page 5 of the Final Office Action, the Examiner has failed to identify any teaching of the feature of searching *the aggregated search results the first search processor* at all, still less using a Hash method to do so, as claimed.

For at least the abovementioned additional reasons, no prima facie case has been set forth against independent claim 1 and that claim, as amended, is believed clearly patentable over the cited art. The other amended independent claims recite a substantially similar feature and are believed patentable for at least the same reason.

Although the abovementioned deficiencies in Li are enough to overcome the defective rejection, applicants wish to point out that the Examiner's reliance on Kottisa as allegedly teaching the concept of searching first search results using a second search method that is different from the first search method, is not well founded.

Kottisa relates to a system that allows a user that has performed an Internet search to more easily look through, i.e., "traverse" the search results. According to Kottisa, typical search results may include thousands of results that are not of any interest to the user. Kottisa's system arranges the search results of the search engine, originally presented in a first order, into a second order, with the hope that the new order will make it more likely that relevant search results will be seen by the user as he looks through the results.

In Kottisa, the *only* search performed is the one performed by search engine 2. No second search is performed at all. The very same results are simply *rearranged*, without searching them again. Kottisa's scrambling of the search results, in the hope that a user will spot more relevant results, does not amount to performing a new search on the results of the search engine.

For this additional reason, even if Li and Kottisa are combined, they do not teach or suggest all of the elements recited in claim 1 or the other independent claims.

Dependent claims 4-8 and 12-16

The dependent claims are believed patentable for at least the same reasons as their respective base claims and stand or fall with their respective base claims.

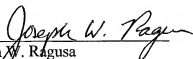
In view of the foregoing, Applicant respectfully submits that the pending claims are allowable over the cited references, and reconsideration and withdrawal of the rejections are respectfully requested and a Notice of Allowance issued.

VIII. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A. As indicated above, the claims in Appendix A include the amendments filed by Applicant on October 30, 2009.

Dated: March 19, 2010

Respectfully submitted,

By   
Joseph W. Ragusa  
Registration No.: 38,586  
DICKSTEIN SHAPIRO LLP  
1633 Broadway  
New York, New York 10019-6708  
(212) 277-6500  
Attorney for Applicant

**APPENDIX A**

**Claims Involved in the Appeal of Application Serial No. 10/716,622**

1. (Previously Presented) A packet search device that performs packet filter search for an inputted packet, comprising:

a first search processor that searches predetermined conditional statements corresponding to a plurality of information areas included in header information of said packet using a first search method to generate first search results; and

a second search processor that searches the first search results of said first search processor using a second search method that is different from said first search method,

wherein said first search processor divides said packet header information into a plurality of information areas and searches across each search conditional statements structured as binary search trees for each of said information areas separately, and

wherein said second search processor searches aggregated search results of said first search processor using a Hash method.

2. (Cancelled).

3. (Cancelled).

4. (Previously Presented) The packet search device according to claim 1, comprising a search database for managing each search result of said first and second search processors for each of said information area.

5. (Original) The packet search device according to claim 4, wherein said search database has a plurality of search keys.

6. (Previously Presented) The packet search device according to claim 1, wherein said second search processor manages only combinations of search results.

7. (Original) The packet search device according to claim 1, wherein at least QoS (Quality of Service) information and filter information are searched for based on said header information.

8. (Original) The packet search device according to claim 1, wherein said packet search processing is performed at least in a router and a firewall.

9. (Previously Presented) A packet processing search method, on a packet search device that includes a first search processor and a second search processor, that searches for a packet filter for an inputted packet before performing packet processing, comprising:

a first step of the first search processor searching predetermined conditional statements corresponding to a plurality of information areas included in header information of said packet using a first search method to generate first search results; and

a second step of the second search processor searching the first search results at said first step using a second search method that is different from said first search method,

wherein in said first step the first search processor divides said packet header information into a plurality of information areas and searches across each search conditional statements structured as binary search trees for each of said information areas separately, and

wherein in said second step the second search processor searches aggregated search results of said first step using a Hash method.

10. (Cancelled).

11. (Cancelled).

12. (Original) The packet processing search method according to claim 9, wherein each search result at said first and second steps is managed for each of said information areas using a search database.

13. (Original) The packet processing search method according to claim 12, wherein said search database has a plurality of search keys.

14. (Previously Presented) The packet processing search method according to claim 9, wherein in said second step the second search processor manages only combinations of search results.

15. (Original) The packet processing search method according to claim 9, wherein at least Qos (Quality of Service) information and filter information are searched for based on header information in said packet.

16. (Original) The packet processing search method according to claim 9, said packet search processing is performed at least in a router and a firewall.

17. (Previously Presented) A computer-readable medium storing a program for causing a program-controlled packet search device that includes a first search processor and a second search processor to perform a packet processing search method that searches for a packet filter for an inputted packet before performing packet processing, causing the program-controlled packet search device to execute,

first processing by the first search processor that searches predetermined conditional statements corresponding to a plurality of information areas included in header information of said packet using a first search method to generate first search results; and

second processing by the second search processor that searches the first search results of said first processing using a second search method that is different from said first search method,

wherein in said first processing the first search processor divides said packet header information into a plurality of information areas and searches across each search conditional statements structured as binary search trees for each of said information areas separately, and

wherein in said second processing the second search processor searches aggregated search results of said first step using a Hash method.



**APPENDIX B**

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted.

**APPENDIX C**

No related proceedings are referenced in II. above, hence copies of decisions in related proceedings are not provided.